1913MNRAS..73..485.

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MONTHLY NOTICES

OF THE

ROYAL ASTRONOMICAL SOCIETY.

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Major E. H. HILLS, C.M.G., F.R.S., PRESIDENT, in the Chair.

Captain Francis Henry Wadsworth, R.M.S. *Caledonia*, Anchor Line, Glasgow,

was balloted for and duly elected a Fellow of the Society.

The following candidate was proposed for election as a Fellow of the Society, the name of the proposer from personal knowledge being appended :—

Nicolas Liapin, University Observatory, Odessa, Russia (proposed by F. W. Dyson).

Seventy-one presents were announced as having been received since the last Ordinary meeting, including, amongst others :—

Astrographic Chart; thirty-four charts from photographs taken at Algiers, Bordeaux, and Paris, presented by the French Minister of Public Instruction.

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An Investigation on the Motion of the Stars.

By C. V. L. Charlier, Assoc. R.A.S. (Plate 19.)

In the following is given a short summary of a research on this subject, which will be published in the next *Meddelande* from the observatory in Lund.

1. Let us consider the proper motions, u and v, in right ascension (multiplied by $\cos\delta$) and in declination of the stars of a certain apparent magnitude m, occurring within a surface (ω), sufficiently small, at the celestial sphere. Such a surface will here be called a *square*.

Forming the correlation table of the u's and v's, it is easily found, even if the number of stars in the square is rather small (say 50–100), that the frequency distribution of the proper motions is far from being a normal one, the essential features of the frequency distribution being, generally, the following:—

(*a*) *The mean values, x_0 and y_0, of u and v are different from zero.* This well-known fact is evidently due, in the main, to the motion of the Sun, relative to the stars in question.

Let O be, for every square, the origin of the co-ordinates corresponding to the values $u=v=o$, and let P $(=\sqrt{x_0^2+y_0^2})$ be the centre of gravity of the correlation surface.

Then O P in magnitude and direction gives the mean apparent displacement of the stars, due to the motion of the Sun.

Representing for different squares the lines O P on a sphere, it is found that these lines, prolonged, pass nearly through the same point of the sphere: *the apparent apex.*

(*b*) *The curves of equal frequency in the correlation table are, approximately, rather prolonged ellipses.* The centre of these ellipses coincides nearly with P. A line through P indicating the direction of the major axis of the curves of equal frequency may suitably be called the *line of symmetry* of the correlation surface.

Representing for different squares these lines of symmetry on a sphere, it is found that even these lines pass nearly through the same point of the sphere: *the apparent vertex.*

That the apparent vertex does not coincide with the apparent apex must be considered as the most important discovery made these last decenniums in that part of astronomy.

(*c*) *The frequency curves of the observed proper motions in right ascension as well as those in declination have a rather pronounced skew appearance.* This skew form is exhibited as well in the correlation surfaces themselves. It was this skew form, together with (*b*), that gave the first impulse to the *hypothesis of the two star-streams.*

(*d*) *These frequency curves have a rather large positive excess.* As to the meaning of this term I refer to *Meddelanden*, Ser. B, No. 4. A positive excess indicates that the stars having *small* proper motions are more numerous than should be the case if the

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